what is claimed is:

1. A method of preparing a low-k dielectric material on a substrate, the method comprising:

providing a precursor layer on said substrate, said layer comprising an organic porogen in a dielectric matrix; and

exposing the precursor layer to a plasma comprising a silanol capping agent provided therein to remove said porogen from the precursor layer to create voids within the dielectric matrix and concurrently protect the dielectric matrix with hydrophobic protecting groups.

2. The method of claim 1, after providing the precursor layer on the substrate, further exposing the precursor layer to ultraviolet radiation to remove at least a portion of the porogen before exposing the precursor layer to the plasma comprising a silanol capping agent provided therein.

3. The method of claim 1, wherein the dielectric matrix comprises silicon and oxygen.

4. The method of claim 1, wherein the dielectric matrix comprises silicon, oxygen, hydrogen and carbon.

5. The method of claim 1, wherein the dielectric matrix is derived from at least one of TEOS, MTEOS, DMDEOS, TMOS, MTMOS, DMDMOS, TMCTS, OMCTS, BTEOSE and BTEOSM.

6. The method of claim 1, wherein the porogen is an organic polymer.

7. The method of claim 1, wherein the precursor layer is formed by chemical vapor deposition, a print on process, dip casting, a spin on process, a spray on process or supercritical dielectric infusion in a polymer matrix.

8. The method of claim 1, wherein the silanol capping agent comprises one or more of a silane amine, a disilazane, a chlorosilane, an aldehyde, an alkylsiloxane and an alkyl alkoxysilane.

9. The method of claim 8, wherein the silanol capping agent comprises one or more of HMDS, DMDMOS, MTMOS, TMCTS, OMCTS, trimethylchlorosilane and acetaldehyde.

10. The method of claim 1, wherein the silanol capping agent is introduced to the plasma using a carrier gas.

11. The method of claim 1, wherein the silanol capping agent is introduced to the plasma without using a carrier gas.

12. The method of claim 1, wherein the plasma further comprises a reducing gas.

13. The method of claim 12, wherein the reducing gas is formed from at least one of hydrogen, ammonia, carbon monoxide and methane.

14. The method of claim 1, wherein the plasma further comprises an oxidizing gas.

15. The method of claim 14, wherein the oxidizing gas is formed from at least one of carbon dioxide, nitrous oxide and oxygen.

16. The method of claim 1, wherein the plasma further comprises at least one of nitrogen, argon and helium.

17. The method of claim 1, wherein a plasma source to generate the plasma has a power ranging between about 100 and about 2000 Watts.

18. The method of claim 1, wherein a high or low frequency plasma source is used to generate the plasma.

19. The method of claim 1, wherein a combination of low and high frequency plasma source(s) is/are used to generate the plasma.

20. The method of claim 1, wherein the plasma is a downstream plasma.

21. The method of claim 1, wherein the substrate temperature during plasma exposure ranges between about 100 and about 400 degrees Celsius.

22. The method of claim 1, wherein the dosage of silanol capping agent provided in the plasma is between about 0.2 and about 20 ml/minute.

23. The method of claim 1, wherein the plasma is provided with a chamber pressure of between about 1 and about 10 Torr.

24. The method of claim 1, wherein exposing the precursor layer to a plasma comprising a silanol capping agent occurs for a time period ranging between about 5 seconds and 20 minutes.

25. A method of preparing a low-k dielectric material on a substrate, the method comprising;

providing a precursor layer on said substrate, said layer comprising an organic porogen in a dielectric matrix;

exposing the precursor layer to a plasma to thereby remove said porogen from the precursor layer to create voids within the dielectric matrix; and

after removing said organic porogen, exposing the dielectric matrix to a silanol capping agent, without first exposing the dielectric matrix to moisture or ambient conditions.

26. The method of claim 25, after providing the precursor layer on the substrate, further exposing the precursor layer to ultraviolet radiation to remove at least a portion of the porogen before exposing the precursor layer to the plasma comprising a silanol capping agent provided therein.

27. The method of claim 25, wherein the plasma comprises a reducing agent.

28. The method of claim 25, wherein the plasma is formed from a gas comprising one or more of hydrogen, a mixture of hydrogen and nitrogen, and ammonia.

29. The method of claim 25, wherein the silanol capping agent comprises one or more of a silane amine, a disilazane, a chlorosilane, an aldehyde, an alkylsiloxane and an alkyl alkoxysilane.

30. The method of claim 25, wherein the silanol capping agent comprises one or more of HMDS, DMDMOS, trimethylchlorosilane and acetaldehyde.

31. The method of claim 25, wherein exposing the dielectric matrix to a silanol capping agent includes providing the silanol capping agent in one of a vapor phase, liquid phase or supercritical phase.

32. The method of claim 25, wherein exposing the dielectric matrix to a silanol capping agent includes providing the silanol capping agent in a second plasma.

33. The method of claim 32, wherein the silanol capping agent is introduced to the second plasma using a carrier gas.

34. The method of claim 33, wherein the carrier gas comprises at least one of nitrogen, argon or helium.

35. The method of claim 33, wherein the carrier gas comprises at least one of a reducing gas and an oxidizing gas.

36. The method of claim 32, wherein the silanol capping agent is introduced to the second plasma without using a carrier gas.

37. The method of claim 32, wherein the dosage of silanol capping agent provided in the second plasma is between about 0.5 and about 2 ml/minute.

38. The method of claim 32, wherein exposing the dielectric matrix to a silanol capping agent occurs for a time period ranging between about 5 seconds and 20 minutes.

39. The method of claim 32, wherein exposing the dielectric matrix to a silanol capping agent includes using plasma power ranging between about 100 and 2000 Watts.

40. The method of claim 32, wherein exposing the dielectric matrix to a silanol capping agent includes using substrate temperature ranges between about 100 and 400 degrees Celsius.

41. The method of claim 32, wherein exposing the dielectric matrix to a silanol capping agent includes using a chamber pressure of between about 1 and about 10 Torr.